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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,860	02/22/2002	Alexander Bietsch		4336

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EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT PAPER NUMBER

1765

DATE MAILED: 05/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/081,860

Applicant(s)

BIETSCH ET AL.

Examiner

Lynette T. Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 6-47 is/are pending in the application.
- 4a) Of the above claim(s) 22-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 6-10, 13-21, 46 and 47 is/are rejected.
- 7) ☒ Claim(s) 11 and 12 is/are objected to.
- 8) ☒ Claim(s) 22-45 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-21 in the reply filed on 1/24/2005 is acknowledged.

Claim Objections

2. Claims 14-21 and 47 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 13-21 and 47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 13, lines 8-12, "at least one non-polar additive which is a disulfide to said liquid etching solution which is a non-polar and is adapted to form an ordered layer on said substrate having a higher affinity to the regions of said substrate covered with SAMs than to the other regions of said substrate" is indefinite because it is unclear

whether the claim requires the disulfide as well as the liquid etching solution be non-polar; it is unclear whether either the disulfide or the liquid etching solution is adapted to form an ordered layer on said substrate having a higher affinity to the regions of said substrate cover with SAMs than to the other regions of said substrate.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 7-9, are rejected under 35 U.S.C. 102(b) as being anticipated by Everhart et al. (US 6,060,256).

Everhart teaches gold samples were coated with an ethanol solution of hexadecane thio (HDT) to form a SAM (self assembling monolayer) and then etched in an aqueous solution of potassium cyanide containing potassium hydroxide while bubbling air (oxygen), (column 12, lines 48-58), which reads on

A wet etching system for selectively patterning substrate having regions covered with self-assembled monolayers (SAMs), thereby controlling the etch profile, said system comprising:

- a) a liquid etching solution comprising a KCN/Oxygen etching composition; and
- b) at least one nonpolar additive comprising a compound having an alkyl chain and a small, polar head group and is selected from the group consisting of alcohols,

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carboxylic acids, amines, sulfates, phosphates and alkanethiols. Since Everhart teaches the same liquid etching solution and nonpolar additive as claimed by applicants, then using Everhart's composition in the same manner as in the claimed invention would inherently result in the at least one nonpolar additive, is added to said liquid etching solution having a higher affinity to the regions of said substrate covered with SAMs than to the other regions of said substrate, **in claim 1**;

wherein said compound is alkanethiol, which is a linear alkanethiol of the general formula $\text{HS}-(\text{CH}_2)_{n-1}-\text{CH}_3$, where $6 < n < 24$, **in claims 7 and 8**; and wherein said alkanethiol is hexadecanethiol, **in claim 9**.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Everhart (US '256), as applied to claim 1 above.

Everhart differs in failing to teach wherein said compound is 1-octanol.

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to replace Everhart's ethanol with octanol because these chemicals are seen as equivalent for the purpose of providing a solvent medium for nonpolar materials.

10. Claims 10 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Everhart (US '256), as applied to claim 1 above.

Everhart differs in failing to teach said hexadecanethiol is present in a concentration in the range of about 0.005 mM to about 0.07mM, **in claim 10**; and 0.02 mM, **in claim 46**.

However, the reference illustrates that the specific thiol is known. As a result, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select any concentration of hexadecanethiol in the reference of Everhart that would effectively accomplish the disclosed composition because it has been held that there is no invention where the difference in proportions is not critical and was ascertained by routine experimentation because the determination of workable ranges is not considered inventive. See *In re Swain and Adams*, 70 USPQ 412 (CPA 1946).

Claim Rejections - 35 USC § 102.

11. Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Fjare (US 5,292,445).

Fjare teaches a wet-etch composition that includes a polymer additive (same as applicants' second additive that is a surfactant) with surfactant properties and which includes polyethylene glycol (column 11, lines 25-30) and include straight or branched alcohols having from 1 to about 12 carbon atoms and at least one OH group (column 7, lines 33-38). The above reads on,

A wet etching system for selectively patterning substrate having regions covered with self-assembled monolayers (SAMs), thereby controlling the etch profile, said system comprising:

- a) a liquid etching solution comprising a KCN/Oxygen etching composition; and
- b) at least one nonpolar additive comprising a compound having an alkyl chain and a small, polar head group and is selected from the group consisting of alcohols, carboxylic acids, amines, sulfates, phosphates and alkanethiols. Since Fjare teaches the same liquid etching solution and nonpolar additive as claimed by applicants, then using Fjare's composition in the same manner as in the claimed invention would inherently result in the at least one nonpolar additive, is added to said liquid etching solution having a higher affinity to the regions of said substrate covered with SAMs than to the other regions of said substrate, **in claim 1**;

wherein said compound is alkanethiol, which is a linear alkanethiol of the general formula $\text{HS}-(\text{CH}_2)_{n-1}-\text{CH}_3$, where $6 < n < 24$, **in claims 7 and 8**; and wherein said alkanethiol is hexadecanethiol, **in claim 9**.

A wet etching system for selectively patterning substrates having regions covered with self-assembled monolayers (SAMs), thereby controlling the etch profile, and at least one additive having a higher affinity to the regions of said substrate covered with SAMs than to the other regions of said substrate, **in claim 1**.

Fjare's straight alcohol having from 1 to 12 carbon atoms and at least one OH group, for example, methanol, ethanol, propanol, . . . and the like (column 7, lines 33-38) encompasses and reads on,

wherein said alcohol is 1-octanol, **in claim 6**.

12. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fjare (US '445) as applied to claim 1 above, and further in view of Everhart et al. (US 6,060,256) and Crooks et al. (US 5,885,753).

Fjare differs in failing to teach, wherein said compound is alkanethiol, which is a linear alkanethiol of the general formula $\text{HS}-(\text{CH}_2)_{n-1}-\text{CH}_3$, where $6 < n < 24$, **in claims 7 and 8**; and

wherein said alkanethiol is hexadecanethiol, **in claim 9**.

Everhart teaches gold samples were coated with an ethanol solution of hexadecane thio (HDT) to form a SAM (self assembling monolayer) and then etched in

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an aqueous solution of potassium cyanide containing potassium hydroxide while bubbling air (oxygen), (column 12, lines 48-58), which reads on

wherein said compound is alkanethiol, which is a linear alkanethiol of the general formula $\text{HS}-(\text{CH}_2)_{n-1}-\text{CH}_3$, where $6 < n < 24$, **in claims 7 and 8**, and wherein said alkanethiol is hexadecanethiol, **in claim 9**.

Since it is known that the presence of a self assembling monolayer (SAM) increases the resistance to chemical etchants (Everhart, column 12, lines 37-39), then it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Fjare by using Everhart's etching solution for the purpose of determining if thiolated protein forms a protective self assembling monolayer (SAM) on gold (column 12, lines 41-43).

13. Claims 10 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fjare (US '445), as applied to claim 1 above, and further in view of in view of Everhart (US '256).

Fjare differs in failing to teach said hexadecanethiol is present in a concentration in the range of about 0.005 mM to about 0.07mM, preferably 0.2mM, **in claim 10** and wherein said hexadecanethiol is present in a concentration of about 0.02 mM, **in claim 46**.

However, the reference of Everhart illustrates that the specific thiol is known. As a result, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select any concentration of hexadecanethiol in the reference of

Everhart, including applicants' claimed concentration that would effectively accomplish the disclosed composition because it has been held that there is no invention where the difference in proportions is not critical and was ascertained by routine experimentation because the determination of workable ranges is not considered inventive. See *In re Swain and Adams*, 70 USPQ 412 (CPA 1946).

Response to Arguments

14. Applicant's arguments with respect to claim 1 and 6-21 have been considered but are moot in view of the new ground(s) of rejection because the added limitation, "a) a liquid etching solution --comprising a KCN/Oxygen etching composition--; and b) at least one --nonpolar-- additive --comprising a compound having . . . , added-- to said liquid etching solution . . ." as (currently amended) claim 1, failed to place application in condition for allowance and failed to overcome the former prior art rejection.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Allowable Subject Matter

16. Claims 11 and 12 are objected to being dependent upon a rejected base claim but would be allowable if rewritten to include all of the limitations of any intervening claims.

17. The following is a statement of reasons for the indication of allowable subject matter:

As to claims 11 and 12, respectively, the prior art of record taken alone or in combination fails to suggest, teach or render obvious an alkanethiol, which is a perfluoroalkanethiol and said perfluoroalkanethiol has a general selected from the group consisting of $F_3C-(CF_2)_{n-3}-CH_2-CH_2-SH$, $CF_3-(CF_2)_{(n-3)}-CO-NH-CH_2-CH_2-SH$ or $CF_3-(CH_2)_{(n-1)}-SH$, in combination with the rest of the limitations of the said claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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LAN VINH
PRIMARY EXAMINER

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April 18, 2005